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(21) International Application Number: PCT/US96/10642 (22) International Filing Date: 20 June 1996 (20.06.96) (30) Priority Data: 60/000,505 26 June 1995 (26.06.95) US (71) Applicant: REVLON CONSUMER PRODUCTS CORPORATION [US/US]; 625 Madison Avenue, New York, NY 10022 (US). (72) Inventors: CALELLO, Joseph, F.; 1133 Caldwell Avenue, Union, NJ 07083 (US). BARONE, Salvatore, J.; 20B Franklin Lane, Staten Island, NY 10306 (US). PATIL, Anjali, A.; 914 Ripley Avenue, Westfield, NJ 07090 (US). KROG, Ann, M.; 36 Rutledge Drive, Red Bank, NJ 07701 (US). (74) Agents: FLINTOFT, Gerald, J. et al.; Pennie & Edmonds, 1155 Avenue of the Americas, New York, NY 10036 (US).		(81) Designated States: AU, BR, CA, CN, IL, JP, KR, MX, NO, NZ, SG, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>With amended claims.</i>
(54) Title: GLOSSY TRANSFER RESISTANT COSMETIC COMPOSITIONS (57) Abstract A cosmetic composition having improved transfer resistance comprising: a) from about 0.1-60 % of a copolymer which is an adhesive at room temperature b) from about 0.1-60 % by weight of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25 °C; c) 0.1-60 % by weight of a nonvolatile oil; and d) 0.1-80 % dry particulate matter.		

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GLOSSY TRANSFER RESISTANT COSMETIC COMPOSITIONS

This application claims priority from Provisional Patent Application Serial No. 60/000505 filed June 26, 1995.

5

Technical Field

The invention is in the field of cosmetic compositions applied to the skin or hair.

10

Background of the Invention

Cosmetic compositions are generally defined as compositions suitable for application to the human body. Cosmetic compositions such as creams and lotions are used to moisturize the skin and keep it in a smooth supple condition.

15 Pigmented cosmetic compositions such as makeup, blush, lipstick, and eyeshadow, are used to color the skin and lips. Since color is one of the most important reasons for wearing cosmetics, color containing cosmetics must be very carefully formulated to provide maximum wear and effect.

20 One of the long standing problems with makeups such as face makeup, lipstick, mascara, and the like, is the tendency of the cosmetic to blot or transfer from the skin or lashes onto other surfaces such as glassware, silverware, or clothing. This not only creates soiling, but forces the
25 cosmetic user to reapply cosmetic at fairly short intervals.

Cosmetic compositions with improved transfer resistance are disclosed in U.S. Patent No. 5,505,937. However, these transfer resistant cosmetic compositions have a very matte texture on the skin and lips.

30 Marketing studies indicate that approximately three out of every five women prefer lipsticks which are glossy because they provide a dewy look which is associated with youthfulness and good health. However, the traditional lipstick formulas provide very matte finishes, as do the
35 transfer resistant lipsticks which are currently so popular. If ingredients which provide enhanced gloss are added to transfer resistant cosmetics in attempt to improve gloss, the

transfer resistance tends to be compromised. Accordingly, there is a great desire to achieve cosmetic compositions with excellent adhesion to the skin, or superior transfer resistance, and at the same time provide high gloss.

5 The object of this invention is to formulate a cosmetic compositions, particularly a lipstick, with long lasting adherence to skin and which also has gloss and shine.

Another object of the invention is to formulate a high gloss high shine cosmetic which yields a film which does not
10 readily transfer to clothing or utensils.

Another object of the invention is to formulate a cosmetic which yields a film which exhibits reduced permeability to oil and water.

Unless otherwise indicated, all percentages and ratios
15 expressed herein are by weight.

Summary of the Invention

The invention is directed to a cosmetic composition with gloss and shine having improved transfer resistance:

- 20 a) from about 0.1-60% by weight of a polymer which is an adhesive at room temperature,
 b) from about 0.1-70% by weight of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C.,
 c) 0.1-60% of a nonvolatile oil
25 d) 0.1-80% dry particulate matter.

Detailed Description

THE POLYMER

The composition of the invention contains 0.1-60%,
30 preferably 0.5-50%, more preferably 1-30% of a polymer which is an adhesive at room temperature. The phrase "adhesive at room temperature" means that at approximately 20°C. the polymer exhibits good affinity to skin. Such polymers may be liquids or solids, and if solids, generally have a melting
35 point of up to 200°C. They are soluble or dispersible in nonpolar solvents. The polymer is of a density, molecular weight, and melting point such that when it is mixed with the

volatile solvent in the disclosed proportions it is capable of forming a solid or gel.

In one preferred embodiment of the invention comprises a vinyl, methacrylic, or acrylic backbone and has pendant
5 siloxane groups and pendant fluorochemical groups. Such polymers preferably comprise repeating A, C, D and optionally B monomers wherein:

A is at least one free radically polymerizable acrylic or methacrylic ester of a 1,1,-dihydroperfluoroalkanol or
10 analog thereof, omega-hydridofluoroalkanols, fluoroalkylsulfonamido alcohols, cyclic fluoroalkyl alcohols, and fluoroether alcohols,

B is at least one reinforcing monomer copolymerizable with A,

15 C is a monomer having the general formula $X(Y)_nSi(R)_{3-m}Z_m$ wherein

X is a vinyl group copolymerizable with the A and B monomers,

Y is a divalent linking group which is alkylene,
20 arylene, alkarylene, and aralkylene of 1 to 30 carbon atoms which may incorporate ester, amide, urethane, or urea groups,

n is zero or 1;

m is an integer of from 1 to 3,

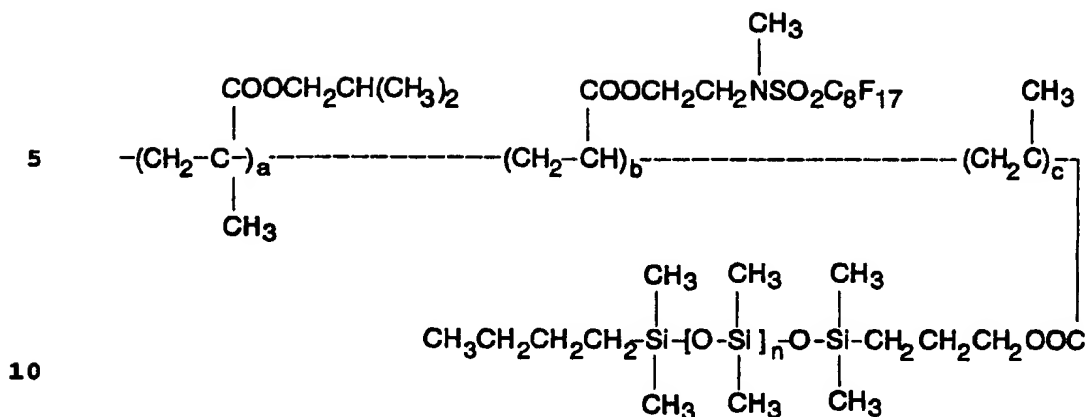
R is hydrogen, C_{1-4} alkyl, aryl, or alkoxy,

25 Z is a monovalent siloxane polymeric moiety; and

D is at least one free radically polymerizable acrylate or methacrylate copolymer.

Such polymers and their manufacture are disclosed in U.S. patent nos 5,209,924 and 4,972,037, which are hereby
30 incorporated by reference.

Preferred is wherein the polymer is a combination of A, C, and D monomers wherein A is a polymerizable acrylic or methacrylic ester of a fluoroalkylsulfonamido alcohol, and where D is a methacrylic acid ester of a C_{1-12} straight or
35 branched chain alkyl, and C is as defined above. Most preferred is a polymer having moieties of the general formula:



wherein a, b, and c are 1-100,000, and the terminal groups can be C₁₋₂₀ straight or branched chain alkyl, aryl, alkoxy, and the like.

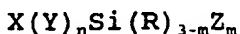
These polymers may be purchased from Minnesota Mining and Manufacturing Company under the tradenames "Silicone Plus" polymers. Most preferred is poly(isobutyl methacrylate -co- methyl FOSEA) -g- poly(dimethylsiloxane) which is sold under the tradename SA 70-5 IBMMF.

In another preferred embodiment of the invention, the polymer has a vinyl, methacrylic, or acrylic polymeric backbone with pendant siloxane groups. Such polymers as disclosed in U.S. patent no.s 4,693,935, 4,981,903, 4,981,902, and which are hereby incorporated by reference. Preferably, these polymers are comprised of A, C, and optionally B monomers wherein:

A is at least one free radically polymerizable vinyl, methacrylate, or acrylate monomer;

B, when present, is at least one reinforcing monomer copolymerizable with A,

C is a monomer having the general formula:



wherein:

X is a vinyl group copolymerizable with the A and B monomers;
Y is a divalent linking group;

n is zero or 1;

m is an integer of from 1 to 3;

R is hydrogen, C₁₋₁₀ alkyl, substituted or unsubstituted phenyl, C₁₋₁₀ alkoxy;

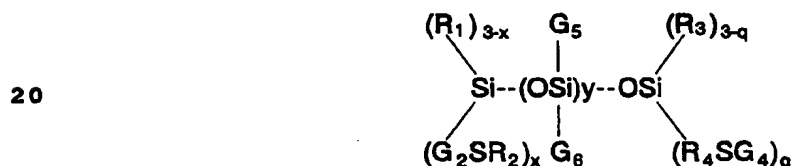
5 Z is a monovalent siloxane polymeric moiety.

Examples of A monomers are lower to intermediate methacrylic acid esters of C₁₋₁₂ straight or branched chain alcohols, styrene, vinyl esters, vinyl chloride, vinylidene chloride, acryloyl monomers, and so on.

10 The B monomer, if present, is a polar acrylic or methacrylic monomer having at least one hydroxyl, amino, or ionic group (such as quaternary ammonium, carboxylate salt, sulfonic acid salt, and so on).

The C monomer is as above defined.

15 In a third preferred embodiment of the invention, the preferred polymer is vinyl-silicone graft or block copolymer having the formula:



wherein G₅ represents monovalent moieties which can independently be the same or different selected from the
 25 group consisting of alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and -ZSA; A represents a vinyl polymeric segment consisting essentially of a polymerized free radically polymerizable monomer, and Z is a divalent
 30 linking group such as C₁₋₁₀ alkylene, aralkylene, arylene, and alkoxylalkylene, most preferably Z methylene or propylene.

G₆ is a monovalent moiety which can independently be the same or different selected from the group consisting of alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and -ZSA;

35 G₂ comprises A;

G₄ comprises A;

R_1 is a monovalent moiety which can independently be the same or different and is selected from the group consisting of alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and hydroxyl; but preferably C_{1-4} alkyl or hydroxyl, and most preferably methyl.

R_2 is independently the same or different and is a divalent linking group such as C_{1-10} alkylene, arylene, aralkylene, and alkoxyalkylene, preferably C_{1-3} alkylene or C_{7-10} aralkylene, and most preferably $-CH_2-$ or 1,3-propylene, and

R_3 is a monovalent moiety which is independently alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, or hydroxyl, preferably C_{1-4} alkyl or hydroxyl, most preferably methyl;

R_4 is independently the same or different and is a divalent linking group such as C_{1-10} alkylene, arylene, aralkylene, alkoxyalkylene, but preferably C_{1-3} alkylene and C_{7-10} alkylene, most preferably $-CH_2-$ or 1,3-propylene.

x is an integer of 0-3;

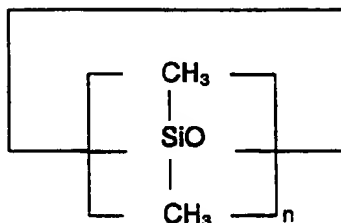
y is an integer of 5 or greater; preferably 10 to 270, and more preferably 40-270;

q is an integer of 0-3.

These polymers are described in U.S. Patent No. 5,468,477, which is hereby incorporated by reference. Most preferred is poly(dimethylsiloxane)-g-poly(isobutyl methacrylate), which is manufactured by 3-M Company under the tradename VS 70 IBM.

THE VOLATILE SOLVENT

The volatile solvents of the invention generally have a low viscosity ranging from 0.1 to 20, and more preferably 0.5-10 centipoise at 25°C. The term "volatile" means that the solvent has a measureable vapor pressure, or in other words a vapor pressure of at least 2 mm. of mercury at 20°C. Volatile solvents suitable in the composition of the invention include volatile low viscosity silicone fluids such as cyclic silicones having the formula:



5

wherein $n=3-7$. Volatile linear polydimethylsiloxanes are also suitable and generally have from about 2 to 9 silicon atoms and are of the formula:

10



wherein $n=0-7$. These silicones are available from various sources including Dow Corning Corporation and General Electric. Dow Corning silicones are sold under the tradenames Dow Corning 244, 245, 344, 345, and 200 fluids. These fluids comprise octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, hexamethyldisiloxane, or mixtures thereof.

Also suitable as the volatile solvent component are straight or branched chain paraffinic hydrocarbons having 5-20 carbon atoms, more preferably 10-16 carbon atoms. Suitable hydrocarbons are pentane, hexane, heptane, decane, dodecane, tetradecane, tridecane, and C_{8-20} isoparaffins as disclosed in U.S. Patent no.s 3,439,088 and 3,818, 105, both of which are hereby incorporated by reference. Preferred volatile paraffinic hydrocarbons have a molecular weight of 70 to 190, more preferably 160-180, and a boiling point range of 30 to 320°C., preferably 60-260°C., a viscosity of less than 20 centipoise at 25°C. Such paraffinic hydrocarbons are available from EXXON under the ISOPARS trademark, and Permethyl Corporation. Such C_{5-20} paraffinic hydrocarbons such as C_{12} isoparaffin manufactured by the Permethyl Corporation having the tradename Permethyl 99A™, or a C_{12} isoparaffin (isododecane) are distributed by Presperse having the tradename Permethyl 99A™. Various C_{16} isoparaffins commercially available, such as isohexadecane (having the tradename Permethyl R™) are also suitable. The volatile

solvent may be a mixture of volatile silicone and paraffinic hydrocarbons; a ratio of 1:20 to 20:1 respectively is suggested. The volatile solvent preferably ranges from 1-60%, or 10-60% by weight of the total composition.

5

THE NONVOLATILE OIL

The nonvolatile oil ranges from 0.1-40%, preferably 0.5-30% by weight of the composition. The term "nonvolatile" means that the oil does not have a measureable vapor pressure, or in other words a vapor pressure of less than 2 mm. of mercury at 20°C. Preferably, the nonvolatile oil has a viscosity ranging from 10 to 1,000,000 centipoise at 25°C., preferably 20 to 600,000 centipoise at 25°C.

The nonvolatile oil may comprise esters of the formula RCO-OR' wherein R and R' are each independently a C₁₋₂₅, preferably a C₄₋₂₀ straight or branched chain alkyl, alkenyl or alkoxy carbonyl alkyl or alkyl carbonyloxy alkyl. Examples of such esters include isotridecyl isononanoate, PEG-4 diheptanoate, isostearyl neopentanoate, tridecyl neopentanoate, cetyl octanoate, cetyl palmitate, cetyl ricinoleate, cetyl stearate, cetyl myristate, coco-dicaprylate/caprate, decyl isostearate, isodecyl oleate, isodecyl neopentanoate, isohexyl neopentanoate, octyl palmitate, dioctyl malate, tridecyl octanoate, myristyl myristate, octododecanol, and fatty alcohols such as oleyl alcohol, isocetyl alcohol, and the like, as well as the esters disclosed on pages 24-26 of the C.T.F.A. Cosmetic Ingredient Handbook, First Edition, 1988, which is hereby incorporated by reference.

The nonvolatile oil may also comprise glyceryl esters of fatty acids, or triglycerides, such as castor oil, lanolin oil, triisocetyl citrate, C₁₀₋₁₈ triglycerides, caprylic/capric/triglycerides, coconut oil, corn oil, cottonseed oil, linseed oil, mink oil, olive oil, palm oil, illipe butter, rapeseed oil, soybean oil, sunflower seed oil, walnut oil, and the like.

Also suitable as the nonvolatile oil are glyceryl esters (excluding fats and oils which are glyceryl esters of fatty acids) which are primarily fatty acid mono-di- and triglycerides which are modified by reaction with other
5 alcohols, for example, acetylated castor oil, glyceryl stearate, glyceryl dioleate, glyceryl distearate, glyceryl trioctanoate, glyceryl distearate, glyceryl linoleate, glyceryl myristate, glyceryl isostearate, PEG castor oils, PEG glyceryl oleates, PEG glyceryl stearates, PEG glyceryl
10 tallowates, and so on.

Also suitable as the nonvolatile oil are nonvolatile hydrocarbons such as isoparaffins, hydrogenated polyisobutene, mineral oil, squalene, petrolatum, and so on.

Also suitable as the nonvolatile oil are various lanolin
15 derivatives such as acetylated lanolin, acetylated lanolin alcohol, and so on.

Nonvolatile nonfluorinated silicones are also suitable as the nonvolatile component. Such silicones preferably have a viscosity of 10 to 600,000 centistokes, preferably 20 to
20 100,000 centistokes at 25°C. Suitable silicones include amodimethicone, bisphenylhexamethicone, dimethicone, dimethicone copolyol, dimethiconol, hexadecyl methicone, hexamethyldisiloxane, methicone, phenyl trimethicone, simethicone, dimethylhydrogensiloxane, stearoxy dimethicone,
25 stearoxytrimethylsilane, vinyl dimethicone, and mixtures thereof. Such silicones are available from Dow Corning as the 3225C formulation aid, Dow 190 and 193 fluids, or similar products marketed by Goldschmidt under the ABIL tradename.

Also suitable as the nonvolatile oil are various
30 fluorinated oils such as fluorinated silicones or perfluoropolyethers. Particularly suitable are fluorosilicones such as trimethylsilyl endcapped fluorosilicone oil, polytrifluoropropylmethylsiloxanes, and similar silicones such as those disclosed in U.S. patent no.
35 5,118,496 which is hereby incorporated by reference. The nonvolatile component may comprise mixtures of fluorosilicones and dimethylpolysiloxanes. The nonvolatile

component may also comprise perfluoropolyethers like those disclosed in U.S. patent nos. 5,183,589, 4,803,067, 5,183,588 all of which are hereby incorporated by reference. These perfluoropolyethers are commercially available from
5 Montefluos under the trademark Fomblin.

Other suitable nonvolatiles include sorbitan derivatives such as PEG sorbitan beeswax, PEG sorbitan isostearate, PEG sorbitan lanolate, PEG sorbitan laurate, PEG sorbitan oleate, PEG sorbitan palmitate, PEG sorbitan stearate, polysorbates,
10 sorbitan trioleates, sorbitan sesquioleates, sorbitan stearates, sorbitan tristearates, and so on.

THE DRY PARTICULATE MATTER

Preferably, the compositions of the invention contain
15 0.1-80%, preferably 0.1-60%, more preferably 0.1-50% dry particulate matter having a particle size of 0.02 to 200, preferably 0.5 to 100 microns. The particulate matter may be colored or non-colored (for example white). Suitable such powders include bismuth oxychloride, titanated mica, fumed
20 silica, spherical silica, polymethylmethacrylate, micronized teflon, boron nitride, acrylate polymers, aluminum silicate, aluminum starch octenylsuccinate, bentonite, calcium silicate, cellulose, chalk, corn starch, diatomaceous earth, fuller's earth, glyceryl starch, hectorite, hydrated silica,
25 kaolin, magnesium aluminum silicate, magnesium carbonate, magnesium hydroxide, magnesium oxide, magnesium silicate, magnesium trisilicate, maltodextrin, montmorillonite, microcrystalline cellulose, rice starch, silica, talc, mica, titanium dioxide, zinc laurate, zinc myristate, zinc
30 neodecanoate, zinc rosinate, zinc stearate, polyethylene, alumina, attapulgite, calcium carbonate, calcium silicate, dextran, kaolin, nylon, silica silylate, silk powder, sericite, soy flour, tin oxide, titanium hydroxide, trimagnesium phosphate, walnut shell powder, or mixtures
35 thereof. The above mentioned powders may be surface treated with lecithin, amino acids, mineral oil, silicone oil, or various other agents either alone or in combination, which

coat the powder surface and render the particles hydrophobic in nature.

The powder component may also comprise various organic and inorganic pigments. The organic pigments are generally various aromatic types including azo, indigoid, triphenylmethane, anthraquinone, and xanthine dyes which are designated as D&C and FD&C blues, browns, greens, oranges, reds, yellows, etc. Organic pigments generally consist of insoluble metallic salts of certified color additives, referred to as the Lakes. Inorganic pigments include iron oxides, ultramarine and chromium or chromium hydroxide colors, and mixtures thereof. Other pigments such as manganese violet, carmine, iron blue (or ferric ammonium ferrocyanide) are also suitable.

Obviously the percentage of pigments used in the powder component will depend upon the type of cosmetic being formulated. Blushes, eyeshadows, lipsticks and similar cosmetics will contain higher percentages of pigment in the powder phase, usually ranging from 5-50% of the total cosmetic composition. Preferably a combination of pigments and non-pigment powders are present, and the pigment:non-pigment powder weight ratio ranges from 1:20 to 20:1.

The cosmetic compositions of the invention may be in the form of anhydrous compositions or water and oil emulsions.

Preferably the cosmetic compositions are anhydrous cosmetic sticks such as lipstick, eyeshadow sticks, concealer sticks, blush sticks, and the like. Preferred cosmetic stick compositions comprise:

- 0.1-30% polymer,
- 10-60% volatile solvent,
- 0.1-30% nonvolatile oil,
- 5-50% dry particulate matter, and
- 1-50% wax.

Suitable wax or wax-like materials generally have a melting point range of 25 to 140°C. Waxes in this category include synthetic waxes such as polyethylenes and derivatives

thereof, ceresin, paraffin, ozokerite, illipe butter, beeswax, carnauba, microcrystalline, lanolin, lanolin derivatives, candelilla, cocoa butter, shellac wax, spermaceti, bran wax, capok wax, sugar cane wax, montan wax, 5 whale wax, bayberry wax, or mixtures thereof.

Preferably the cosmetic compositions are anhydrous lipsticks composition comprises:

0.1-30% of a polymer selected from the group consisting of poly(dimethylsiloxane)-g-poly(isobutyl methacrylate), 10 poly(isobutyl methacrylate-co-methyl FOSEA)-g-poly(dimethylsiloxane), and mixtures thereof;

10-60% of a volatile solvent which is a volatile silicone, volatile paraffinic hydrocarbon, or mixtures thereof,

15 0.1-30% of a nonvolatile oil,
5-50% of a dry particulate matter having a particle size of 0.02 to 100 microns, and
1-50% of a wax having a melting point of 25-140°C.

In addition, cosmetic stick compositions may 20 additionally contain one or more of preservatives, antioxidants, emulsifiers, thickeners, and so on. The ingredients corresponding to these categories are set forth in the C.T.F.A. Cosmetic Ingredient Handbook, First Edition, 1988, which is hereby incorporated by reference.

25 Creams or lotions are generally water-in-oil or oil-in-water emulsions containing water, humectants, surfactants, preservatives, sunscreens, dry particulate matter, and the like. Generally the ranges of these ingredients are 0.1-80% water, 0.01-10% humectants, 0.01-5% 30 surfactants, 0.001-5% preservatives, and 0.001-5% sunscreens. Suitable emollients, humectants, surfactants, preservatives and sunscreens are as set forth in the C.T.F.A. Cosmetic Ingredient Handbook, First Edition, 1988, which is hereby incorporated by reference.

35 Creams may be anhydrous, or aqueous, and contain water, humectants, surfactants, thickeners, sunscreens,

preservatives, and sunscreens, as mentioned above, may also be included.

The creams and lotions of the invention are particularly good vehicles for sunscreen. In particular, about 0.01-10%
5 by weight of various sunscreen compounds such as PABA, cinnamates, benzophenones, and derivatives thereof can be incorporated into the cream or lotion. Because the compositions exhibit superior transfer resistance characteristics, the sunscreens are able to remain on the
10 skin for a longer time period. Suitable creams in accordance with the invention are sunscreen creams comprising:

1-30% polymer

1-40% volatile solvent

0.5-30% nonvolatile oil

15 0.1-70% dry particulate matter.

The dry particulate matter is largely titanium dioxide and other powdered materials which provide good sunscreen protection.

The compositions of the invention may also be in the
20 form of face powders comprising:

0.1-60% polymer,

0.1-60% of a volatile solvent having a viscosity of 0.5
to 20 centipoise at 25°C.,

0.1-60% of a nonvolatile oil, and

25 0.01-80% of a dry particulate matter.

The composition of the invention may also be incorporated into mascaras which generally comprise film formers, waxes, emulsifiers, and pigment.

Suitable mascara compositions comprise:

30 0.1-15% polymer

0.1-40% of a volatile solvent having a viscosity of 0.5
to 20 centipoise at 25°C.,

0.1-10% of a nonvolatile oil,

0.1-30% of a dry particulate matter,

35 0.1-20% film former,

0.1-30% wax, and

0.1-10% emulsifier.

Preferably, the volatile solvent comprises a mixture of volatile silicone and a volatile hydrocarbon, and the dry particulate matter comprises a combination of pigments and non-pigment powders.

5 Suitable waxes are as set forth above. Suitable film formers include acacia gum, cellulose derivatives, guar derivatives and all those set forth on pages 68-69 of the C.T.F.A. Cosmetic Ingredient Handbook, First Edition, 1988, which is hereby incorporated by reference.

10 Suitable emulsifiers or emulsifying agents are as set forth on pages 90 to 94 of the C.T.F.A. Cosmetic Ingredient Handbook, First Edition, 1988, which is hereby incorporated by reference.

The composition of the invention may also be
15 incorporated into water and oil emulsion makeup compositions. Makeup generally contains water, and pigment in addition to an oil phase. Suitable cosmetic makeup compositions comprise:

0.1-20% polymer
20 0.1-40% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C.,
0.1-25% of a nonvolatile oil,
0.1-70% dry particulate matter having a particle size of 0.02 to 100 microns, and
25 0.1-50% water.

Preferably, the nonvolatile oils are dimethicone and dimethicone copolyol, and the pigment to non-pigment powder weight ratio is 1:20 to 20:1.

The cosmetically acceptable vehicle may also be a blush.
30 Preferred are blush compositions comprising:

0.1-20% polymer,
0.1-30% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C.,
0.1-25% of a nonvolatile oil,
35 0.1-10% water, and
0.1-70% dry particulate matter having a particle size of 0.02 to 100 microns.

In the above composition, it is preferred that the nonvolatile oils are dimethylhydrogen siloxane, dimethicone, dimethiconol, and fluorosilicone.

The cosmetically acceptable vehicle may also be an
5 eyeshadow. Eyeshadows generally contain pigment or powder in addition to waxes and oils. Preferred eyeshadow compositions comprise:

- 0.1-20% polymer,
- 0.1-30% of a volatile solvent having a viscosity of 0.5
10 to 20 centipoise at 25°C.,
- 0.1-40% nonvolatile oil,
- 0.1-60% dry particulate matter having a particle size of 0.02 to 100 microns.

In the above eyeshadow composition, it is preferred that
15 the volatile solvent comprises cyclomethicone and the nonvolatile oil comprises dimethiconol.

The cosmetically acceptable vehicle may also be a concealer, which generally comprises pigment or other powder, wax, and other ingredients such as humectants, preservatives,
20 etc. A preferred composition of the invention is a concealer comprising:

- 0.1-15% polymer,
- 0.1-40% of a volatile solvent having a viscosity of 0.5
to 20 centipoise at 25°C.,
- 25 0.1-35% of a nonvolatile oil, and
- 0.1-40% of a dry particulate matter having a particle size of 0.02 to 100 microns.

In this concealer composition it is preferred that the nonvolatile oil comprises fluorinated silicone,
30 dimethylpolysiloxane or mixtures thereof.

The compositions of the invention provide cosmetics which adhere well to the skin and exhibit reduced transfer resistance.

The invention will be further described in connection
35 with the following examples which are set forth for the purpose of illustration only.

EXAMPLE 1

A transfer resistant lipstick composition in the stick form was made as follows:

	<u>w/w%</u>
5 Synthetic wax	7.00
Ceresin	3.50
Ozokerite	2.25
Paraffin	2.00
Octyldodecanol, cholesterol, trilaurin	
10 phospholipids, glycosphingolipids	0.50
Illipe butter	0.20
Polypropylene	0.10
Methyl paraben	0.30
15 Propyl paraben	0.10
BHA	0.10
SA-70SIBMMF (25% in cyclomethicone)*	10.50
Vitamin E acetate	0.10
Apple extract/vegetable oil	0.50
20 Phytantriol	0.10
Vitamin A & D3 corn oil	0.20
Maleated soybean oil	0.50
Isostearyltrimethylolpropanesiloxysilicate/ black iron oxide	0.08
25 Mica, lecithin	14.37
Mica	2.50
Titanium dioxide, mica	2.00
Titanium dioxide, mica, iron oxide	1.00
30 Isododecane	12.00
Cyclomethicone	29.60
* 3-M, poly(isobutyl methacrylate -co- methyl FOSEA) -g- poly(dimethylsiloxane)	

35 The ingredients were heated, mixed, and poured into sticks. The sticks were hard, and when applied provided a slightly transfer proof finish that did not kiss off when the

lips were placed on the back of the hand. The stick provided a muted glossy, dewy finish on the lips.

EXAMPLE 2

5	<u>w/w%</u>		
	<u>eyeshadow</u>	<u>blush</u>	<u>concealer</u>
	Coco caprylate/caprate	2.200	2.200
	Cetyl acetate/acetylated		2.200
	lanolin alcohol	1.000	1.000
10	SA-70SIBMMF		
	(25% in cyclomethicone)	7.000	7.000
	Synthetic wax	6.600	6.600
	Ceresin wax	4.000	4.000
	Paraffin wax	3.000	3.000
15	Ozokerite	1.000	1.000
	Octyldodecanol/trilaurin/ phospholipid/cholesterol/ glycosphingolipid	0.500	0.500
	Illipe butter	0.200	0.200
20	Polypropylene	0.100	0.100
	Methyl paraben	0.300	0.300
	Propyl paraben	0.100	0.100
	BHA	0.100	0.100
25	Lanolin oil	3.500	3.500
	D&C red 7 ca lake	-----	2.100
	FD&C yellow 5 al lake	-----	0.800
	Red iron oxide	2.100	-----
	Yellow iron oxide	0.800	-----
30	Black iron oxide	0.500	0.500
	Titanium dioxide	0.100	0.100
	Bismuth oxychloride	3.000	3.000
	Titanium dioxide/mica	9.000	9.000
	Cyclomethicone	41.40	41.400
35	Mica/dimethicone	2.000	2.000
	Isododecane	9.000	9.000

Trioctyldodecyl citrate	2.000	2.000	2.000
Cococaprylate/caprate	0.500	0.500	0.500

The above cosmetic compositions were made by first
 5 mixing the dry ingredients. The waxes and oils were added
 with heating to about 100°C. The volatile solvent and
 polymer were added. The remaining ingredients were added and
 the mixture stirred before pouring the mixtures into the
 appropriate molds and allowing to cool.

10

EXAMPLE 3

A transfer resistant lipstick composition in accordance
 with the invention was made as follows:

	<u>w/w%</u>
15 Synthetic wax	7.00
Ceresin	3.50
Ozokerite	2.25
Paraffin	2.00
20 Octyldodecanol, cholesterol, trilaurin	
phospholipids, glycosphingolipids	0.50
Illipe butter	0.20
Polypropylene	0.10
Methyl paraben	0.30
25 Propyl paraben	0.10
BHA	0.10
VS 70 IBM in Finsolv (25% in cyclomethicone)*	10.50
Vitamin E acetate	0.10
Apple extract/vegetable oil	0.50
30 Phytantriol	0.10
Vitamin A & D3 corn oil	0.20
Maleated soybean oil	0.50
Isostearyltrimethylolpropanesiloxysilicate/black	
iron oxide	0.08
35 Mica, lecithin	14.37
Mica	2.50

	Titanium dioxide, mica	2.00
	Titanium dioxide, mica, iron oxide	1.00
	Isododecane	12.00
5	Cyclomethicone	29.60
	* 3-M Company, poly(dimethylsiloxane)-g-poly(isobutyl methacrylate)	

EXAMPLE 4

10 A glossy transfer resistant lip gel was made as follows:

	<u>w/w%</u>
VS70-5 ¹ in isododecane (50/50)	13.00
SA70-5 ² in cyclomethicone (25/75)	53.00
Dimethicone (0.65 cs)	27.00
15 Diisostearyl fumerate	7.00
¹ Poly(dimethylsiloxane)-g-poly(isobutyl methacrylate)	
² Poly(isobutyl methacrylate-co-methyl FOSEA-g-polydimethylsiloxane)	

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The gel provides a very smooth, glossy finish when applied to the lips and does not transfer off.

EXAMPLE 5

25 A lip gel with gloss and transfer resistance was made as follows:

	<u>w/w%</u>
SA70-5 ¹ in cyclomethicone (25/75)	51.00
30 VS70-5 ² in isododecane	14.50
Dimethicone (0.65 cs)	27.00
Diisostearyl fumerate	7.00
Synthetic hydrocarbons	0.50
¹ Poly(isobutyl methacrylate-co-methyl 35 FOSEA-g-polydimethylsiloxane)	
² Poly(dimethylsiloxane)-g-poly(isobutyl methacrylate)	

While the invention has been described in connection with preferred embodiments, it is not intended to limit the scope of the invention to the particular form set forth, but, on the contrary, it is intended to cover such alternatives, 5 modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

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WE CLAIM:

1. A transfer resistant cosmetic composition comprising, by weight of the total composition:
 - 5 a) from about 0.1-60% by weight of a polymer which is an adhesive at room temperature,
 - b) from about 0.1-60% by weight of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C., and
 - 10 c) 0.1-60% by weight of a nonvolatile oil.
 - d) 0.1-80% dry particulate matter having a particle size of 0.02 to 200 microns which is a mixture of pigments and powders wherein the pigment to powder weight ratio ranges from 1:20 to 20:1, and
 - 15 e) 1-50% of a wax having a melting point of 25-140°C.
- 20 2. The composition of claim 1 wherein the polymer has a vinyl, acrylic, or methacrylic backbone.
3. The composition of claim 2 wherein the polymer has pendant siloxane groups.
4. The composition of claim 2 wherein the polymer has
25 pendant siloxane groups and pendant fluorochemical groups.
5. The composition of claim 4 comprising:
 - 0.1-30% polymer,
 - 10-60% of a volatile solvent having a viscosity of
30 0.5 to 20 centipoise at 25°C.,
 - 0.1-30% of a nonvolatile oil,
 - 5-50% of dry particulate matter having a particle size of 0.05 to 100 microns, and
 - 1-50% of a wax having melting point of 25 to 140°C.
- 35 6. The composition of claim 5 wherein the polymer is a copolymer comprising repeating A, C, and D monomers wherein

A is at least one free radically polymerizable acrylic or methacrylic ester of a 1,1,-dihydroperfluoroalkanol or analog thereof, omega-hydridofluoroalkanols, fluoroalkylsulfonamido alcohols, cyclic fluoroalkyl alcohols, and fluoroether alcohols;

C is a monomer having the general formula $X(Y)_nSi(R)_{3-m}Z_m$ wherein

X is a vinyl group copolymerizable with the A and B monomers,

Y is a divalent linking group which is alkylene, arylene, alkarylene, and aralkylene of 1 to 30 carbon atoms which may incorporate ester, amide, urethane, or urea groups,

n is zero or 1;

m is an integer of from 1 to 3,

R is hydrogen, C_{1-4} alkyl, aryl, phenyl, or substituted phenyl, or alkyoxy,

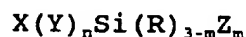
Z is a monovalent siloxane polymeric moiety, and

D is at least one free radically polymerizable acrylate or methacrylate copolymer.

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7. The composition of claim 6 wherein the A monomer is a free radically polymerizable acrylic or methacrylic ester of fluoroalkylsulfonamido alcohol.

8. The composition of claim 6 wherein the unit of the C monomer is

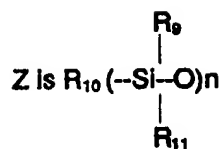


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wherein X is $\begin{array}{cc} R_7 & R_8 \\ | & | \\ CH & =CH \end{array}$

wherein R_7 is COOH and R_8 is methyl, Y is a divalent linking group,

35



5

wherein R_{10} is a C_{1-20} alkylene, R_9 and R_{11} are methyl.

9. The composition of claim 6 wherein the D monomer is a methacrylic acid ester of a C_{1-12} straight or branched chain alkyl.

10

10. The composition of claim 6 wherein the volatile solvent is cyclomethicone.

11. The composition of claim 6 wherein the volatile solvent is cyclomethicone, a linear volatile silicone, or a paraffinic hydrocarbon.

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12. The composition of claim 6 wherein the nonvolatile oil is selected from the group consisting of:

20

a) esters of the formula $\text{RCO-OR}'$ wherein R and R' are each independently a C_{1-24} straight or branched chain alkyl, alkenyl, or alkoxy,

25

b) triglycerides,

c) glyceryl esters,

d) nonvolatile hydrocarbons,

e) lanolin and lanolin derivatives,

f) nonvolatile, nonfluorinated silicones,

g) fluorinated silicones,

30

h) perfluoropolyethers,

i) sorbitan derivatives,

j) and mixtures thereof.

13. The composition of claim 1 which is an anhydrous stick.

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14. The composition of claim 6 wherein the wax is synthetic wax, ceresin, paraffin, ozokerite, illipe butter, beeswax, carnauba, microcrystalline, lanolin, candelilla, cocoa butter, shellac, spermaceti, bran, capok, sugar cane, montan, 5 whale, bayberry or mixtures thereof.

15. An anhydrous stick cosmetic composition comprising, by weight of the total composition:

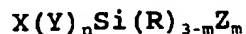
- 0.1-30% poly(isobutyl methacrylate-co-methyl
10 FOSEA)-g-polydimethylsiloxane,
 - 10-60% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C. and selected from the group consisting of cyclomethicone, linear polydimethylsiloxane, paraffinic hydrocarbons, and mixtures thereof,
- 15 0.1-30% of a nonvolatile oil selected from the group consisting of:
 - a) esters of the formula RCO-OR' wherein R and R' are each independently a C₁₋₂₄ straight or branched chain alkyl, alkenyl, alkoxycarbonylalkyl, or
20 alkylcarbonyloxyalkyl,
 - b) triglycerides,
 - c) glyceryl esters,
 - d) nonvolatile hydrocarbons,
 - e) lanolin and lanolin derivatives,
 - 25 f) nonvolatile, nonfluorinated silicones,
 - g) fluorinated silicones,
 - h) perfluoropolyethers,
 - i) sorbitan derivatives,
 - j) and mixtures thereof,
- 30 5-50% dry particulate matter having a particle size of 0.02 to 100 microns which is a mixture of pigments and powders where the pigment to powder weight ratio ranges from 1:20 to 20:1, and
1-50% of a wax having a melting point of 25 to
35 140°C.

16. The composition of claim 3 wherein the polymer comprises A, C, and optionally B monomer units wherein:

A is at least one free radically polymerizable vinyl, methacrylate, or acrylate monomer;

5 B, when present, is at least one reinforcing monomer copolymerizable with A,

C is a monomer having the general formula:



wherein:

10 Z is a vinyl group copolymerizable with the A and B monomers;

Y is a divalent linking group;

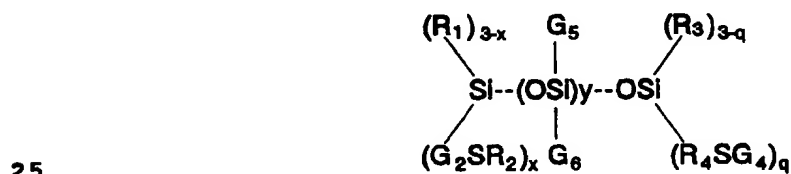
n is zero or 1;

m is an integer of from 1 to 3;

15 R is hydrogen, C₁₋₁₀ alkyl, substituted or unsubstituted phenyl, C₁₋₁₀ alkoxy;

Z is a monovalent siloxane polymeric moiety.

17. The composition of claim 1 wherein the polymer is a
20 vinyl-silicone graft or block copolymer having the formula:



wherein G₅ represents monovalent moieties which can independently be the same or different selected from the group consisting of alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and -ZSA; A represents a vinyl
30 polymeric segment consisting essentially of a polymerized free radically polymerizable monomer, and Z is a divalent linking group such as C₁₋₁₀ alkylene, aralkylene, arylene, and alkoxyalkylene, most preferably Z methylene or propylene.

35 G₆ is a monovalent moiety which can independently be the same or different selected from the group consisting of

alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and -ZSA;

G₂ comprises A;

G₄ comprises A;

5 R₁ is a monovalent moiety which can independently be the same or different and is selected from the group consisting of alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and hydroxyl; but preferably C₁₋₄ alkyl or hydroxyl, and most preferably methyl.

10 R₂ is independently the same or different and is a divalent linking group such as C₁₋₁₀ alkylene, arylene, aralkylene, and alkoxyalkylene, preferably C₁₋₃ alkylene and C₇₋₁₀ aralkylene, and most preferably -CH₂- or 1,3-propylene, and

15 R₃ is a monovalent moiety which is independently alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and hydroxyl, preferably C₁₋₄ alkyl or hydroxyl, most preferably methyl;

R₄ is independently the same or different and is a 20 divalent linking group such as C₁₋₁₀ alkylene, arylene, aralkylene, alkoxyalkylene, but preferably C₁₋₃ alkylene and C₇₋₁₀ alkylene, most preferably -CH₂- and 1,3-propylene.

x is an integer of 0-3;

y is an integer of 5 or greater; preferably 10 to 270, and

25 more preferably 40-270;

q is an integer of 0-3.

18. The composition of claim 17 comprising:

30 0.1-30% polymer,
10-60% volatile solvent,
0.1-30% nonvolatile oil,
5-50% dry particulate matter, and
1-50% wax.

35 19. The composition of claim 18 wherein the polymer is poly(dimethylsiloxane)-g-poly(isobutyl methacrylate).

20. The composition of claim 19 wherein the volatile solvent is cyclomethicone, a linear polydimethylsiloxane, a paraffinic hydrocarbon, or mixtures thereof.

5 21. The composition of claim 19 wherein the nonvolatile oil is selected from the group consisting of:

- a) esters of the formula RCO-OR' wherein R and R' are each independently a C₁₋₂₄ straight or branched chain alkyl, alkenyl, alkoxy carbonyl alkyl, or
- 10 alkyl carbonyloxy alkyl,
- b) triglycerides,
- c) glyceryl esters,
- d) nonvolatile hydrocarbons,
- e) lanolin and lanolin derivatives,
- 15 f) nonvolatile, nonfluorinated silicones,
- g) fluorinated silicones,
- h) perfluoropolyethers,
- i) sorbitan derivatives,
- j) and mixtures thereof.

20

22. The composition of claim 19 wherein the wax is synthetic wax, ceresin, paraffin, ozokerite, illipe butter, beeswax, carnauba, microcrystalline, lanolin, candelilla, cocoa butter, shellac, spermaceti, bran, capok, sugar cane, montan,

25 whale, bayberry or mixtures thereof.

23. An anhydrous cosmetic stick composition comprising, by weight of the total composition:

0.1-30% poly(dimethylsiloxane)-g-poly(isobutyl

30 methacrylate).

10-60% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C. and selected from the group consisting of cyclomethicone, linear polydimethylsiloxane, paraffinic hydrocarbons, and mixtures thereof,

35 0.1-30% of nonvolatile oil selected from the group consisting of:

- a) esters of the formula RCO-OR' wherein R and R' are each independently a C₁₋₂₄ straight or branched chain alkyl, alk nyl, alk xycarbonylalkyl, or alkylcarbonyloxyalkyl,
- 5 b) triglycerides,
 c) glyceryl esters,
 d) nonvolatile hydrocarbons,
 e) lanolin and lanolin derivatives,
 f) nonvolatile, nonfluorinated silicones,
10 g) fluorinated silicones,
 h) perfluoropolyethers,
 i) sorbitan derivatives,
 j) and mixtures thereof,
- 5-50% dry particulate matter having a particle size
15 of 0.02 to 100 microns which is a mixture of pigments and powders where the pigment to powder weight ratio ranges from 1:20 to 20:1; and
- 1-50% of a wax having a melting point of 25 to 140°C.
- 20
24. A mascara composition comprising, by weight of the total composition:
- 0.1-15% of a polymer which is an adhesive at room temperature,
- 25 0.1-40% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C.,
- 0.1-10% of a nonvolatile oil,
- 0.1-30% of dry particulate matter having a particle size of 0.02 to 100 microns,
- 30 0.1-20% of a film former,
- 0.1-30% of a wax having a melting point of 25 to 140°C., and
- 0.1-10% of an emulsifier.
- 35 25. The composition of claim 24 wherein the film former is acacia gum, a cellulose derivative, a guar derivative, or mixtures thereof.

26. A water and oil emulsion makeup composition comprising, by weight of the total composition:

0.1-20% of a polymer which is an adhesive at room temperature,

5 0.1-20% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C.

0.1-25% of a nonvolatile oil selected from the group consisting of:

a) esters of the formula RCO-OR' wherein R and R' are each independently a C_{1-24} straight or branched chain alkyl, alkenyl, or alkoxy,

- b) triglycerides,
- c) glyceryl esters,
- d) nonvolatile hydrocarbons,
- 15 e) lanolin and lanolin derivatives,
- f) nonvolatile, nonfluorinated silicones,
- g) fluorinated silicones,
- h) perfluoropolyethers,
- i) sorbitan derivatives,
- 20 j) and mixtures thereof,

0.1-70% dry particulate matter having a particle size of 0.02 to 100 microns which is a mixture of pigments and powders wherein the pigment to powder weight ratio is 1:20 to 20:1, and

25 0.1-50% water.

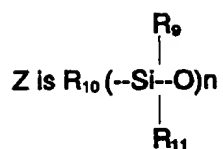
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AMENDED CLAIMS

[received by the International Bureau on 5 December 1996 (05.12.96);
original claims 1,12,15,16,21,23 and 26 amended; remaining
claims unchanged (8 pages)]

1. A transfer resistant cosmetic composition comprising, by weight of the total composition:
 - 5 a) from about 0.1-60% by weight of a polymer which is an adhesive at room temperature,
 - b) from about 0.1-70% by weight of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C., and
 - 10 c) 0.1-60% by weight of a nonvolatile oil,
 - d) 0.1-80% dry particulate matter having a particle size of 0.02 to 200 microns which is a mixture of pigments and powders wherein the pigment to powder weight ratio ranges from 1:20 to 20:1, and
 - 15 e) 1-50% of a wax having a melting point of 25-140°C.
2. The composition of claim 1 wherein the polymer has a vinyl, acrylic, or methacrylic backbone.
- 20 3. The composition of claim 2 wherein the polymer has pendant siloxane groups.
4. The composition of claim 2 wherein the polymer has pendant siloxane groups and pendant fluorochemical groups.
- 25 5. The composition of claim 4 comprising:
 - 0.1-30% polymer,
 - 10-60% of a volatile solvent having a viscosity of
 - 30 0.5 to 20 centipoise at 25°C.,
 - 0.1-30% of a nonvolatile oil,
 - 5-50% of dry particulate matter having a particle size of 0.05 to 100 microns, and
 - 1-50% of a wax having melting point of 25 to 140°C.
- 35 6. The composition of claim 5 wherein the polymer is a copolymer comprising repeating A, C, and D monomers wherein



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wherein R_{10} is a C_{1-20} alkylene, R_9 and R_{11} are methyl.

9. The composition of claim 6 wherein the D monomer is a methacrylic acid ester of a C_{1-12} straight or branched chain alkyl.

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10. The composition of claim 6 wherein the volatile solvent is cyclomethicone.

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11. The composition of claim 6 wherein the volatile solvent is cyclomethicone, a linear volatile silicone, or a paraffinic hydrocarbon.

20

12. The composition of claim 6 wherein the nonvolatile oil is selected from the group consisting of:

a) esters of the formula $\text{RCO-OR}'$ wherein R and R' are each independently a C_{1-25} straight or branched chain alkyl, alkenyl, or alkoxycarbonylalkyl or alkylcarbonyloxyalkyl,

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b) triglycerides,

c) glyceryl esters,

d) nonvolatile hydrocarbons,

e) lanolin and lanolin derivatives,

f) nonvolatile, nonfluorinated silicones,

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g) fluorinated silicones,

h) perfluoropolyethers,

i) sorbitan derivatives,

j) and mixtures thereof.

35

13. The composition of claim 1 which is an anhydrous stick.

14. The composition of claim 6 wherein the wax is synthetic wax, ceresin, paraffin, ozokerite, illipe butter, beeswax, carnauba, microcrystalline, lanolin, candelilla, cocoa butter, shellac, spermaceti, bran, capok, sugar cane, montan, 5 whale, bayberry or mixtures thereof.

15. An anhydrous stick cosmetic composition comprising, by weight of the total composition:

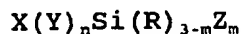
- 0.1-30% poly(isobutyl methacrylate-co-methyl
10 FOSEA)-g-polydimethylsiloxane,
 - 10-60% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C. and selected from the group consisting of cyclomethicone, linear polydimethylsiloxane, paraffinic hydrocarbons, and mixtures thereof,
 - 15 0.1-30% of a nonvolatile oil selected from the group consisting of:
 - a) esters of the formula RCO-OR' wherein R and R' are each independently a C_{1-25} straight or branched chain alkyl, alkenyl, alkoxycarbonylalkyl, or
 - 20 alkylcarbonyloxyalkyl,
 - b) triglycerides,
 - c) glyceryl esters,
 - d) nonvolatile hydrocarbons,
 - e) lanolin and lanolin derivatives,
 - 25 f) nonvolatile, nonfluorinated silicones,
 - g) fluorinated silicones,
 - h) perfluoropolyethers,
 - i) sorbitan derivatives,
 - j) and mixtures thereof,
 - 30 5-50% dry particulate matter having a particle size of 0.02 to 100 microns which is a mixture of pigments and powders where the pigment to powder weight ratio ranges from 1:20 to 20:1, and
 - 35 1-50% of a wax having a melting point of 25 to 140°C.

16. The composition of claim 3 wherein the polymer comprises A, C, and optionally B monomer units wherein:

A is at least one free radically polymerizable vinyl, methacrylate, or acrylate monomer;

5 B, when present, is at least one reinforcing monomer copolymerizable with A,

C is a monomer having the general formula:



wherein:

10 Y is a divalent linking group;

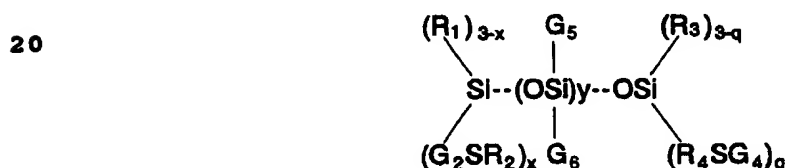
n is zero or 1;

m is an integer of from 1 to 3;

R is hydrogen, C₁₋₁₀ alkyl, substituted or unsubstituted phenyl, C₁₋₁₀ alkoxy;

15 Z is a monovalent siloxane polymeric moiety.

17. The composition of claim 1 wherein the polymer is a vinyl-silicone graft or block copolymer having the formula:



25 wherein G₅ represents monovalent moieties which can independently be the same or different selected from the group consisting of alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and -ZSA; A represents a vinyl polymeric segment consisting essentially of a polymerized
30 free radically polymerizable monomer, and Z is a divalent linking group such as C₁₋₁₀ alkylene, aralkylene, arylene, and alkoxyalkylene, most preferably Z methylene or propylene.

G₆ is a monovalent moiety which can independently be the same or different selected from the group consisting of
35 alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and -ZSA;

G₂ comprises A;

G₄ comprises A;

R₁ is a monovalent moiety which can independently be the same or different and is selected from the group consisting of alkyl, aryl, aralkyl, alkoxy, alkylamino, 5 fluoroalkyl, hydrogen, and hydroxyl; but preferably C₁₋₄ alkyl or hydroxyl, and most preferably methyl.

R₂ is independently the same or different and is a divalent linking group such as C₁₋₁₀ alkylene, arylene, aralkylene, and alkoxyalkylene, preferably C₁₋₃ alkylene and 10 C₇₋₁₀ aralkylene, and most preferably -CH₂- or 1,3-propylene, and

R₃ is a monovalent moiety which is independently alkyl, aryl, aralkyl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and hydroxyl, preferably C₁₋₄ alkyl or hydroxyl, 15 most preferably methyl;

R₄ is independently the same or different and is a divalent linking group such as C₁₋₁₀ alkylene, arylene, aralkylene, alkoxyalkylene, but preferably C₁₋₃ alkylene and C₇₋₁₀ alkylene, most preferably -CH₂- and 1,3-propylene.
20 x is an integer of 0-3;
y is an integer of 5 or greater; preferably 10 to 270, and more preferably 40-270;
q is an integer of 0-3.

25 18. The composition of claim 17 comprising:

0.1-30% polymer,
10-60% volatile solvent,
0.1-30% nonvolatile oil,
5-50% dry particulate matter, and
30 1-50% wax.

19. The composition of claim 18 wherein the polymer is poly(dimethylsiloxane)-g-poly(isobutyl methacrylate).

35 20. The composition of claim 19 wherein the volatile solvent is cyclomethicone, a linear polydimethylsiloxane, a paraffinic hydrocarbon, or mixtures thereof.

21. The composition of claim 19 wherein the nonvolatile oil is selected from the group consisting of:

- a) esters of the formula $\text{RCO-OR}'$ wherein R and R' are each independently a C_{1-25} straight or branched chain alkyl, alkenyl, alkoxycarbonylalkyl, or alkylcarbonyloxyalkyl,
- b) triglycerides,
- c) glyceryl esters,
- d) nonvolatile hydrocarbons,
- 10 e) lanolin and lanolin derivatives,
- f) nonvolatile, nonfluorinated silicones,
- g) fluorinated silicones,
- h) perfluoropolyethers,
- i) sorbitan derivatives,
- 15 j) and mixtures thereof.

22. The composition of claim 19 wherein the wax is synthetic wax, ceresin, paraffin, ozokerite, illipe butter, beeswax, carnauba, microcrystalline, lanolin, candelilla, cocoa butter, shellac, spermaceti, bran, capok, sugar cane, montan, whale, bayberry or mixtures thereof.

23. An anhydrous cosmetic stick composition comprising, by weight of the total composition:

25 0.1-30% poly(dimethylsiloxane)-g-poly(isobutyl methacrylate).

10-60% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C. and selected from the group consisting of cyclomethicone, linear polydimethylsiloxane, 30 paraffinic hydrocarbons, and mixtures thereof,

0.1-30% of nonvolatile oil selected from the group consisting of:

- a) esters of the formula $\text{RCO-OR}'$ wherein R and R' are each independently a C_{1-25} straight or branched chain alkyl, alkenyl, alkoxycarbonylalkyl, or 35 alkylcarbonyloxyalkyl,
- b) triglycerides,

- 5 c) glyceryl esters,
d) nonvolatile hydrocarbons,
e) lanolin and lanolin derivatives,
f) nonvolatile, nonfluorinated silicones,
g) fluorinated silicones,
h) perfluoropolyethers,
i) sorbitan derivatives,
j) and mixtures thereof,
5-50% dry particulate matter having a particle size
10 of 0.02 to 100 microns which is a mixture of pigments and
powders where the pigment to powder weight ratio ranges from
1:20 to 20:1; and
1-50% of a wax having a melting point of 25 to
140°C.
- 15 24. A mascara composition comprising, by weight of the total
composition:
0.1-15% of a polymer which is an adhesive at room
temperature,
20 0.1-40% of a volatile solvent having a viscosity of
0.5 to 20 centipoise at 25°C.,
0.1-10% of a nonvolatile oil,
0.1-30% of dry particulate matter having a particle
size of 0.02 to 100 microns,
25 0.1-20% of a film former,
0.1-30% of a wax having a melting point of 25 to
140°C., and
0.1-10% of an emulsifier.
- 30 25. The composition of claim 24 wherein the film former is
acacia gum, a cellulose derivative, a guar derivative, or
mixtures thereof.

26. A water and oil emulsion makeup composition comprising,
35 by weight of the total composition:
0.1-20% of a polymer which is an adhesive at room
temperature,

0.1-40% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25°C.

0.1-25% of a nonvolatile oil selected from the group consisting of:

- 5 a) esters of the formula RCO-OR' wherein R and R' are each independently a C_{1-25} straight or branched chain alkyl, alkenyl, or alkoxycarbonylalkyl or alkylcarbonyloxyalkyl,
- 10 b) triglycerides,
- c) glyceryl esters,
- d) nonvolatile hydrocarbons,
- e) lanolin and lanolin derivatives,
- f) nonvolatile, nonfluorinated silicones,
- g) fluorinated silicones,
- 15 h) perfluoropolyethers,
- i) sorbitan derivatives,
- j) and mixtures thereof,

 0.1-70% dry particulate matter having a particle size of 0.02 to 100 microns which is a mixture of pigments
20 and powders wherein the pigment to powder weight ratio is 1:20 to 20:1, and

 0.1-50% water.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/10642

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A61K 7/021

US CL : 424/63

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/63

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P --- Y,P	US 5,505,937 A (CASTROGIOVANNI ET AL.) 09 April 1996, columns 1-6.	1, 13, 24, 25 ----- 2-12, 14-23, 26
Y	US 4,972,037 A (GARBE ET AL.) 20 November 1990, columns 3-4, 12-14.	4-12, 14, 15
Y,P	US 5,468,477 A (KUMAR ET AL.) 21 November 1995, columns 4, 36-38.	2, 3, 16-23, 26

☐

Further documents are listed in the continuation of Box C.

☐

See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

26 SEPTEMBER 1996

Date of mailing of the international search report

10 OCT 1996

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/10642

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐

The additional search fees were accompanied by the applicant's protest.

☒

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/10642

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-25 (note the presence of two claims labelled as "18" and no claim "17"), drawn to a transfer resistance composition and anhydrous products of such.

Group II, claim(s) 26, drawn to a water and oil emulsion makeup composition.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The generic composition and species thereof of Group I do not require water, are not specified as emulsions and exclude water in specific embodiments. The composition of claim 26 contains water, is in emulsion form and contains different concentrations of components as compared to the Group I compositions.